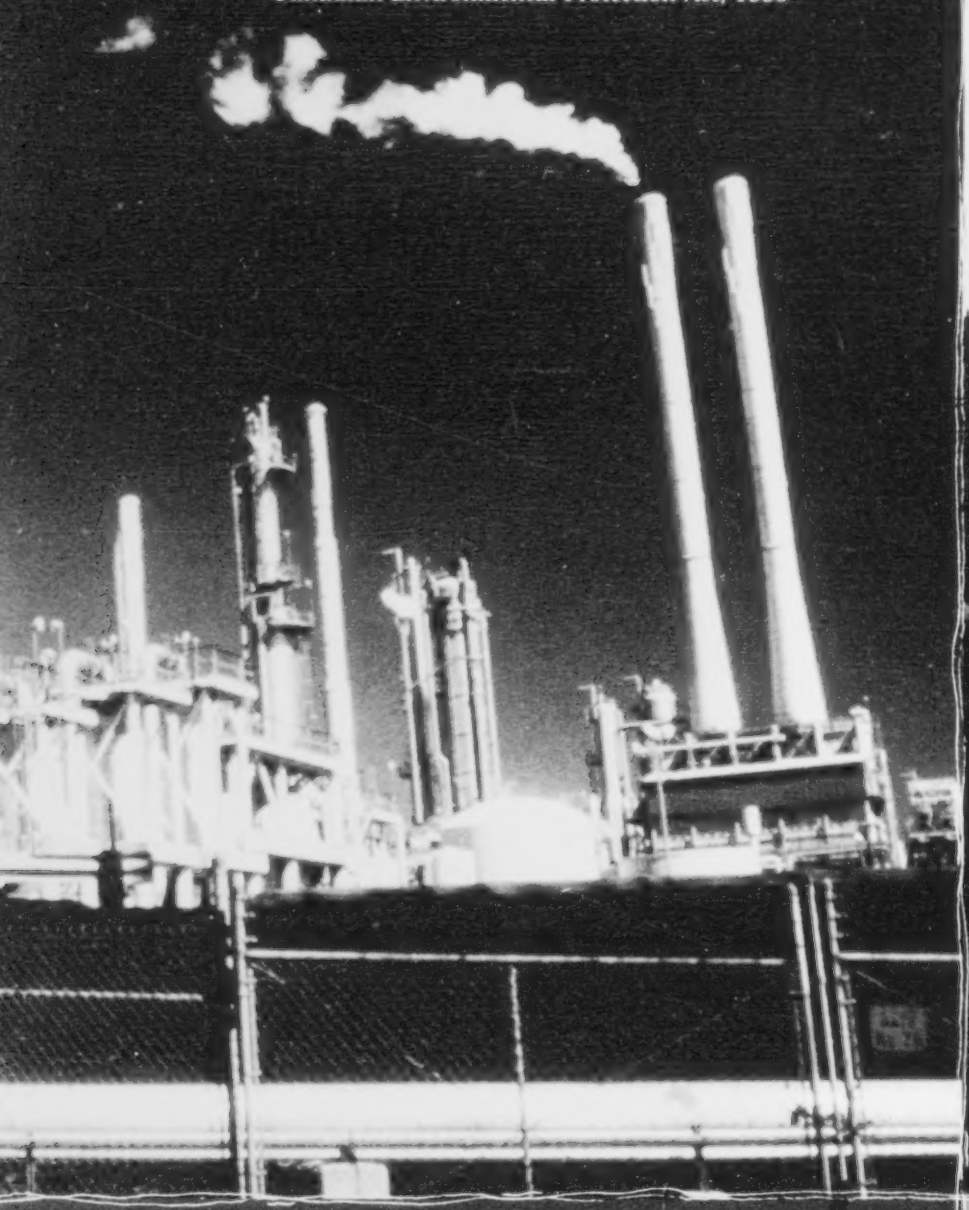
2001 National Overview — National Pollutant Release Inventory

Canadian Environmental Protection Act, 1999



Releases

www.ec.gc.ca/npri

November 2003

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National Overview —

National Pollutant Release Inventory

Canadian Environmental Protection Act, 1999

Releases

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1 OVERVIEW OF THE NPRI

1.1 What Is the NPRI?

The National Pollutant Release Inventory (NPRI) is a legislated, nationwide, publicly accessible inventory of pollutants released to the environment. It was created in 1992 to provide Canadians with information on pollutant releases from facilities located in their communities, including the quantities discharged to air, water, land, and underground injection and the quantities sent to other facilities for disposal, treatment, or recycling and energy recovery. It also supports a number of environmental initiatives, by providing information that:

- helps governments and others to identify priorities for action;
- encourages industry to take proactive measures to reduce releases;
- allows for tracking of progress in reducing releases; and
- supports a number of regulatory initiatives.

The NPRI is a constantly evolving program. Public and stakeholder consultation is an integral part of the changes to the program. Since the NPRI's inception, substances have been added and deleted, the thresholds at which substances are reported have been adjusted, and the NPRI has expanded in scope to collect data on recycling and pollution prevention activities. Further refinements are planned for future years.

The NPRI program is delivered by Environment Canada under the authority of the *Canadian Environmental Protection Act* (CEPA).[1] Owners or operators of facilities that manufacture, process, or otherwise use one or more of the NPRI-listed substances under prescribed conditions are required to submit an annual report to Environment Canada on the releases and transfers of those substances.[2]

For more information, refer to Environment Canada's NPRI Web site at **www.ec.gc.ca/npri/**, or contact your nearest NPRI office.

1.2 What's New for the 2001 NPRI?

1.2.1 NPRI Substance List for 2001

The NPRI changed significantly for the 2000 reporting year with the introduction of alternate reporting thresholds. Certain substances are listed at alternate thresholds because they pose serious risks to human health or the environment in relatively low quantities, and very limited data, if any, would be reported to the NPRI for these substances at the original 10-tonne and 1% concentration reporting threshold. Substances with alternate reporting thresholds in the 2001 NPRI include mercury (and its compounds), 17 polycyclic aromatic hydrocarbons (PAHs), dioxins/furans, and hexachlorobenzene (HCB).

The following changes were made to the NPRI substance list for the 2001 reporting year:

- addition of N,N-dimethylformamide (CAS No. 68-12-2) to Schedule 1, Part I, of the 2001 *Canada Gazette* notice;
- amalgamation of the individual isomers of cresol (*m*-, *o*-, and *p*-cresol) under the "cresol (all isomers)" listing;
- changed qualifier for vanadium to "(except when in an alloy) and its compounds" from "fume or dust"; and
- de-listing of phosphoric acid (CAS No. 7664-38-2).

The list of NPRI substances for the 2001 reporting year is provided in a supplementary table found on the NPRI Web site at **www.ec.gc.ca/npri/**

1.2.2 2001 National Overview Series

The 2001 National Pollutant Release Inventory (NPRI) National Overview (referred to as the "2001 National Overview") consists of the following series of documents:

- 2001 National Overview — Reporting Requirements, National Pollutant Release Inventory;
- 2001 National Overview — Summary of 2001 Data, National Pollutant Release Inventory;

1 The 1988 CEPA was in force for previous years of NPRI reporting. CEPA 1999 came into force in April 2000 and is the authority for the 2001 reporting year and beyond.

2 The requirements for the 2001 NPRI were published in the *Canada Gazette*, Part I, on December 29, 2001.

- 2001 National Overview — Releases, National Pollutant Release Inventory;
- 2001 National Overview — Final Disposal and Off-site Transfers for Treatment Prior to Final Disposal, National Pollutant Release Inventory; and
- 2001 National Overview — Recycling and Energy Recovery, National Pollutant Release Inventory.

The 2001 National Overview was categorized in this manner to provide Canadians with more focused and concise summaries regarding the NPRI reporting requirements, on-site releases of pollutants, final disposal of pollutants and off-site transfer of pollutants for treatment prior to final disposal, and information on recycling and energy recovery in Canada for the 2001 reporting year. The 2001 National Overview series includes data as they appeared in the NPRI database on **November 8, 2002**.

In addition to the 2001 National Overview series, Environment Canada has developed a new report entitled *Informing Canadians on Pollution 2003: Highlights of the 2001 National Pollutant Release Inventory (NPRI)*. This report provides a snapshot of pollution from industrial and commercial companies in Canada in 2001. In addition to marking progress on sector and pollutant releases and disposal and recycling trends, other highlights include special sections on toxic substances, pollution prevention, managing pollution in Canada, and tips on how communities and individuals can use the NPRI.

1.2.3 New Groupings for Releases and Transfers

Environment Canada engaged stakeholders during 2002 to review the "reporting in" and "reporting out" of NPRI information. This review was identified as a priority during the consultation process by the NPRI Multistakeholder Work Group on Substances. In previous reporting years, some stakeholders expressed concerns with the reporting of pollutants sent to a landfill on site as a release to the environment, whereas transfers off site of pollutants for final disposal to a landfill were reported as transfers. This difference in classification could lead to a different representation of the same activity, depending on whether it occurred on site or off site. There is also an issue of perception — sending substances to a landfill is perceived differently from releases to air and water.

Stakeholders have recommended that releases include only releases to air and water and those releases that disperse material on land. Substances sent to landfill or land farm or underground injection on site should be grouped together with transfers off site destined for a similar fate. Other options are possible, but the recommended option has a number of advantages, including the following:

- Similar activities are portrayed in a similar manner, whether they occur on site or off-site.
- It will be easier to track trends in disposal.
- It provides a more intuitive presentation of information.

Through this work with stakeholders, a new format was established for summarizing releases and transfers of NPRI pollutants. The following groupings were used to summarize information collected through the NPRI for the 2001 reporting year:

On-site pollutant releases:

- air
- water
- land — includes spills, leaks, and other

Final disposal:

- on-site disposal: landfill, land treatment, and underground injection
- off-site disposal: landfill, land treatment, underground injection, and storage

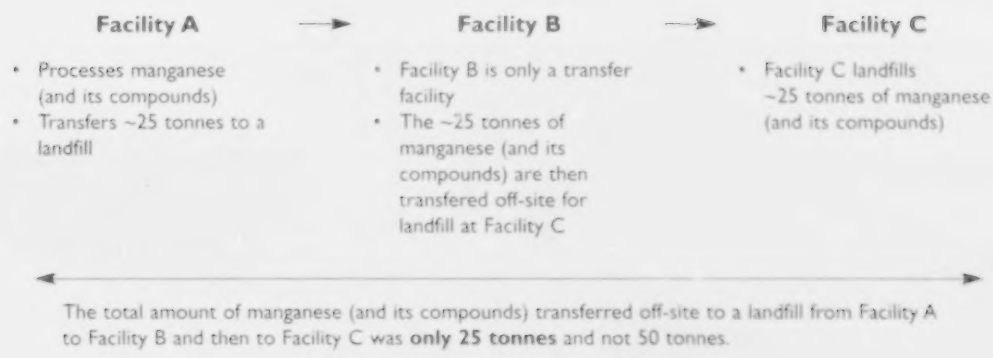
Off-site transfers for treatment prior to final disposal:

- physical treatment
- chemical treatment
- biological treatment
- incineration or thermal treatment where energy is not recovered
- treatment at a municipal sewage treatment plant (MSTP)

Off-site transfers for recycling and energy recovery:

- recycling
- energy recovery

Figure 1-1 Example of Double Counting


Facility A
• Processes manganese (and its compounds)
• Transfers ~25 tonnes to a landfill
Facility B
• Facility B is only a transfer facility
• The ~25 tonnes of manganese (and its compounds) are then transfered off-site for landfill at Facility C
Facility C
• Facility C landfills ~25 tonnes of manganese (and its compounds)
The total amount of manganese (and its compounds) transferred off-site to a landfill from Facility A to Facility B and then to Facility C was **only 25 tonnes** and not 50 tonnes.

Appendix A provides NPRI definitions for releases and transfers.

Double counting is an issue that needs to be considered when attempting to add releases and transfers together. It is important to understand that there is no double counting of releases and disposal on site, whereas transfers may be counted more than once. In Figure 1-1, for example, Facility A transfers approximately 25 tonnes of manganese (and its compounds) (deemed to be a waste material by Facility A) to Facility B (a transfer facility). Facility B then transfers the same 25 tonnes of manganese (and its compounds) to Facility C, which proceeds to landfill this material. In addition, Facility A, Facility B, and Facility C file reports to NPRI for the 2001 reporting year. In this example, it is important to note that **only 25 tonnes** (and not 50 tonnes) of manganese (and its compounds) in total are transferred off site from Facility A to Facility B and then to Facility C.

2 ON-SITE RELEASES IN 2001

In 2001, 2618 facilities across Canada reported to the NPRI, of which 2099 facilities submitted data on on-site releases totalling an estimated 181 007 tonnes. Releases to air accounted for an estimated 124 017 tonnes (68.5%), releases to water totalled 51 601 tonnes (28.5%), and releases to land totalled 5390 tonnes (3.0%) (see Figure 2-1 and Table 2-1).

Releases of NPRI-listed pollutants to air decreased by an estimated 6394 tonnes (or -4.9%) from 2000. However, releases to water increased by an estimated 4023 tonnes (or +8.5%) from 2000. This can be attributed mainly to an increase in the quantities of total ammonia and nitrate ion in solution released to surface waters from facilities classified in the water, sewage, or other systems category (North American Industry Classification System (NAICS) No. 2213). Releases to land increased by an estimated 448 tonnes (+9.1%) from 2000.

For additional information on the facilities and companies that reported to the NPRI for the 2001 reporting year and a summary of releases of individual pollutant(s) per medium (air, water, and land), refer to the supplementary tables found on the NPRI Web site at **www.ec.gc.ca/npri/**.

It is important to note that increases and decreases in pollutant releases can be attributed to numerous factors (which should be considered when using NPRI information), including, but not limited to, the following:

- facilities reporting to the NPRI for the first time;
- facilities using improved estimation methodologies;
- changes in facility infrastructure and processes/operations; and
- use of pollution prevention techniques.

Figure 2-1 On-site Releases in 2001

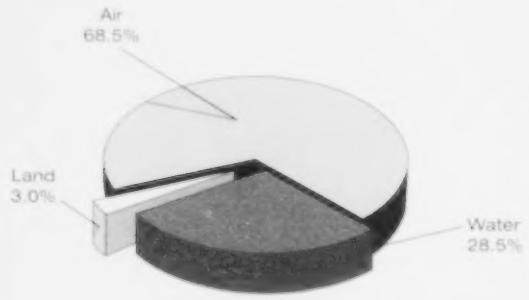


Table 2-1 National Summary of On-site Releases in 2001[a]

	2000	2001	Change (2000–2001)	% change (2000–2001)
Total facilities	1 810	2 099	289	16.0
Total reports	8 160	9 502	1 342	16.4
Pollutants reported	187	188	1	0.5
On-site releases (tonnes)				
Air	130 410.4	124 016.5	-6 393.8	-4.9
Water	47 578.1	51 600.8	4 022.8	8.5
Land				
Spills	60.8	33.7	-27.1	-44.5
Leaks	6.8	9.9	3.1	45.5
Other	4 874.2	5 346.1	471.9	9.7
Land subtotal	4 941.8	5 389.7	448.0	9.1
Total on-site releases	**182 930.2**	**181 007.1**	**-1 923.1**	**-1.1**

[a] Because of rounding of values and in some quantities, the totals may not equal the sum of the individual values.

Table 2-1 National Summary of On-site Releases in 2001[A]

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Land:				
Spills	60.8	33.7	-27.1	-44.5
Leaks	6.8	9.9	3.1	45.5
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Land subtotal	4 941.8	5 389.7	448.0	9.1
Total on-site releases	**182 930.2**	**181 007.1**	**-1 923.1**	**-1.1**

[A] Because of rounding of release and transfer quantities, the totals may not equal the sum of the individual values.

3 TWENTY-FIVE NPRI POLLUTANTS RELEASED ON SITE IN THE LARGEST QUANTITIES IN 2001

Table 3-1 highlights the 25 NPRI-listed pollutants released on site in the largest quantities in 2001, by environmental medium. These 25 pollutants accounted for an estimated 167 528 tonnes (92.6%) of total on-site releases.

Of these 25 NPRI-listed pollutants, the following six accounted for approximately 64.7% of total releases:

- ammonia (total): 40 915 tonnes (22.6%);
- nitrate ion in solution (at a pH of 6.0 or greater): 22 501 tonnes (12.4%);
- methanol: 20 428 tonnes (11.3%);
- hydrochloric acid: 16 595 tonnes (9.2%);
- sulphuric acid: 9387 tonnes (5.2%); and
- hydrogen sulphide: 7234 tonnes (4.0%).

Based on the new groupings for releases and transfers in the 2001 National Overview series, some pollutants have shifted either up or down on the listing of the 25 NPRI-listed pollutants released on site in the largest quantities. For example, hydrogen sulphide was listed in the 2000 National Overview as being the NPRI-listed pollutant released in the largest quantities in 2000, with an estimated total release of 154 594 tonnes; this is because an estimated 148 462 tonnes of hydrogen sulphide were sent for on-site underground injection in 2000. By comparison, in 2001, Table 3-1 shows that hydrogen sulphide (7234 tonnes (4.0%)) was sixth on the list of pollutants released in the largest quantities.

Calcium fluoride is another NPRI-listed pollutant that was affected by this new grouping for releases and transfers. Calcium fluoride was listed sixth in 2000, with a total release of 11 733 tonnes; in 2001, however, calcium fluoride was not listed in the top 25 pollutants released overall. Other NPRI-listed pollutants that ranked in the top 25 for total on-site releases in 2000, but not in 2001, included manganese (and its compounds), lead (and its compounds), and asbestos (friable form). These NPRI-listed pollutants all appear now in the list of the top 25 pollutants for on-site and off-site final disposal.

In summary, the total releases of the NPRI-listed pollutants in 2001 (as shown in Table 3-1) were found to be consistent with estimated release values reported for these pollutants by facilities in 2000. There were increases for some specific pollutants (e.g., nitrate ion in solution (at a pH of 6.0 or greater) — an increase of 2756 tonnes (or +14.0%)) and decreases for other pollutants (e.g., ammonia (total) — a decrease of 1471 tonnes (or -3.5%)).

Table 3-1 Twenty-five NPRI Pollutants Released On Site in the Largest Quantities in 2001, by Environmental Medium

		Releases (tonnes)						
CAS No.	Pollutant	Air	Water	Land	2001 Total	2000 Total	Change (2000–2001)	% change (2000–2001)
NA	Ammonia (total)	14 792.0	26 106.0	11.1	40 915.0	42 385.7	-1 470.7	-3.5
NA	Nitrate ion in solution at pH ≥6.0	13.9	22 450.1	36.9	22 500.8	19 744.7	2 756.1	14.0
67-56-1	Methanol	19 728.6	697.1	1.9	20 427.5	21 808.5	-1 380.9	-6.3
7647-01-0	Hydrochloric acid	16 536.6	22.4	36.3	16 595.3	16 209.4	385.9	2.4
7664-93-9	Sulphuric acid	9 320.2	61.1	6.1	9 387.3	10 471.7	-1 084.4	-10.4
7783-06-4	Hydrogen sulphide	7 181.2	53.1	0.0	7 234.3	7 735.3	-500.9	-6.5
1330-20-7	Xylene (mixed isomers)	6 325.3	0.3	1.9	6 327.4	6 714.8	-387.4	-5.8
108-88-3	Toluene	5 903.2	0.6	4.8	5 908.5	6 528.3	-619.7	-9.5
78-93-3	Methyl ethyl ketone	4 137.6	0.0	0.0	4 137.6	5 076.3	-938.7	-18.5
75-15-0	Carbon disulphide	4 065.3	0.0	0.0	4 065.3	3 164.0	901.4	28.5
110-54-3	*n*-Hexane	3 560.4	0.0	2.3	3 562.8	3 562.7	0.1	0.0
NA	Zinc (and its compounds)	1 090.6	307.9	1 911.5	3 310.0	2 691.5	618.5	23.0
7664-39-3	Hydrogen fluoride	3 257.7	0.0	0.0	3 257.7	3 600.8	-343.1	-9.5
74-85-1	Ethylene	2 472.0	0.0	0.0	2 472.0	2 710.0	-238.0	-8.8
107-21-1	Ethylene glycol	247.1	58.0	2 042.3	2 347.4	2 564.2	-216.8	-8.5
NA	Manganese (and its compounds)	246.2	1 156.6	792.6	2 195.4	1 740.2	455.2	26.2
100-42-5	Styrene	1 633.0	0.0	0.0	1 833.0	1 700.4	132.7	7.8
75-09-2	Dichloromethane	1 777.2	0.0	0.0	1 777.2	2 218.8	-441.6	-19.9
67-63-0	Isopropyl alcohol	1 750.8	0.0	0.2	1 751.0	1 695.9	55.1	3.2
50-00-0	Formaldehyde	1 698.8	28.5	0.0	1 727.3	1 803.1	-75.8	-4.2
110-82-7	Cyclohexane	1 381.5	0.3	0.5	1 382.3	1 495.0	-112.7	-7.5
111-76-2	2-Butoxyethanol	1 222.9	0.2	0.0	1 223.1	1 359.6	-136.6	-10.0
75-07-0	Acetaldehyde	1 068.7	26.7	0.1	1 095.4	954.7	140.8	14.7
71-43-2	Benzene	1 046.2	0.4	0.5	1 047.1	1 133.6	-86.5	-7.6
71-36-3	*n*-Butyl alcohol	1 047.1	0.0	0.0	1 047.1	1 215.7	-168.6	-13.9
Largest on-site releases		111 710.0	50 969.3	4 848.9	167 528.2	170 284.8	-2 756.7	-1.6
National total		124 016.5	51 600.8	5 389.7	181 007.1	182 930.2	-1 923.1	-1.1
% of national total		90.1	98.8	90.0	92.6	93.1	-0.5	-0.6

Table 3-1 Twenty-five NPRI Pollutants Released On Site in the Largest Quantities in 2001, by Environmental Medium

		Releases (tonnes)						
CAS No.	Pollutant	Air	Water	Land	2001 Total	2000 Total	Change (2000–2001)	% change (2000–2001)
NA	Ammonia (total)	14 798.0	26 106.0	11.1	40 915.0	42 385.7	-1 470.7	-3.5
NA	Nitrate ion in solution at pH ≥6.0	13.9	22 450.1	36.9	22 500.8	19 744.7	2 756.1	14.0
67-56-1	Methanol	19 728.6	697.1	1.9	20 427.5	21 808.5	-1 380.9	-6.3
7647-01-0	Hydrochloric acid	16 536.6	22.4	36.3	16 595.3	16 209.4	385.9	2.4
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7783-06-4	Hydrogen sulphide	7 181.2	53.1	0.0	7 234.3	7 735.3	-500.9	-6.5
1330-20-7	Xylene (mixed isomers)	6 325.3	0.3	1.9	6 327.4	6 714.8	-387.4	-5.8
108-88-3	Toluene	5 903.2	0.6	4.8	5 908.5	6 528.3	-619.7	-9.5
78-93-3	Methyl ethyl ketone	4 137.6	0.0	0.0	4 137.6	5 076.3	-938.7	-18.5
75-15-0	Carbon disulphide	4 065.3	0.0	0.0	4 065.3	3 164.0	901.4	28.5
110-54-3	*n*-Hexane	3 560.4	0.0	2.3	3 562.8	3 562.7	0.1	0.0
NA	Zinc (and its compounds)	1 090.6	307.9	1 911.5	3 310.0	2 691.5	618.5	23.0
7664-39-3	Hydrogen fluoride	3 257.7	0.0	0.0	3 257.7	3 600.8	-343.1	-9.5
74-85-1	Ethylene	2 472.0	0.0	0.0	2 472.0	2 710.0	-238.0	-8.8
107-21-1	Ethylene glycol	247.1	58.0	2 042.3	2 347.4	2 564.2	-216.8	-8.5
NA	Manganese (and its compounds)	246.2	1 156.6	792.6	2 195.4	1 740.2	455.2	26.2
100-42-5	Styrene	1 833.0	0.0	0.0	1 833.0	1 700.4	132.7	7.8
75-09-2	Dichloromethane	1 777.2	0.0	0.0	1 777.2	2 218.8	-441.6	-19.9
67-63-0	Isopropyl alcohol	1 750.8	0.0	0.2	1 751.0	1 695.9	55.1	3.2
50-00-0	Formaldehyde	1 698.8	28.5	0.0	1 727.3	1 803.1	-75.8	-4.2
110-82-7	Cyclohexane	1 381.5	0.3	0.5	1 382.3	1 495.0	-112.7	-7.5
111-76-2	2-Butoxyethanol	1 222.9	0.2	0.0	1 223.1	1 359.6	-136.6	-10.0
75-07-0	Acetaldehyde	1 068.7	26.7	0.1	1 095.4	954.7	140.8	14.7
71-43-2	Benzene	1 046.2	0.4	0.5	1 047.1	1 133.6	-86.5	-7.6
71-36-3	*n*-Butyl alcohol	1 047.1	0.0	0.0	1 047.1	1 215.7	-168.6	-13.9
Largest on-site releases		**111 710.0**	**50 969.3**	**4 848.9**	**167 528.2**	**170 284.8**	**-2 756.7**	**-1.6**
National total		**124 016.5**	**51 600.8**	**5 389.7**	**181 007.1**	**182 930.2**	**-1 923.1**	**-1.1**
% of national total		**90.1**	**98.8**	**90.0**	**92.6**	**93.1**	**-0.5**	**-0.6**

4 INDUSTRIAL SECTORS RELEASING THE LARGEST QUANTITIES OF NPRI POLLUTANTS ON SITE IN 2001

In 2001, the following five industrial sectors reported the largest on-site releases of NPRI pollutants, accounting for an estimated 110 008 tonnes (60.8%) of total releases (see Table 4-1):

- NAICS No. 2213, Water, Sewage and Other Systems: 39 654 tonnes (21.9%);
- NAICS No. 3221, Pulp, Paper and Paperboard Mills: 30 693 tonnes (17.0%);
- NAICS No. 2211, Electricity Generation, Transmission and Distribution: 19 744 tonnes (10.9%);
- NAICS No. 3253, Pesticide, Fertilizer and Other Agricultural Chemical Manufacturing: 10 102 tonnes (5.6%); and
- NAICS No. 2111, Oil and Gas Extraction: 9816 tonnes (5.4%).

Facilities that reported from the **Water, Sewage and Other Systems** industrial sector (NAICS No. 2213) reported an estimated 39 654 tonnes in 2001, an increase of 3582 tonnes (or +9.9%) over 2000. This was mainly due to an overall increase in releases from the following two pollutants:

- ammonia (total): 1553 tonnes (or +7.4%);
- nitrate ion in solution (at a pH of 6.0 or greater): 2107 tonnes (or +14.4%).

Facilities that reported from the **Pulp, Paper and Paperboard Mills** industrial sector (NAICS No. 3221) reported an estimated 30 693 tonnes in 2001, a decrease of 692 tonnes (or -2.2%) compared with 2000. This was mainly due to an overall decrease from the sector of an estimated 1522 tonnes (or -9.8%) in releases of methanol.

Facilities that reported from the **Electricity Generation, Transmission and Distribution** industrial sector (NAICS No. 2211) reported an estimated 19 744 tonnes in 2001, a decrease of 292 tonnes (or -1.5%) from 2000. This was mainly due to an overall decrease from the sector of an estimated 716 tonnes (or -5.3%) in releases of hydrochloric acid to air.

Facilities that reported from the **Pesticide, Fertilizer and Other Agricultural Chemical Manufacturing** industrial sector (NAICS No. 3253) reported an estimated 10 102 tonnes in 2001, a decrease of 280 tonnes (or -2.7%) compared with 2000. This was mainly due to an overall decrease from the sector of an estimated 602 tonnes (or -6.4%) in releases of ammonia (total).

Facilities that reported from the **Oil and Gas Extraction** industrial sector (NAICS No. 2111) reported an estimated 9816 tonnes in 2001, a decrease of 313 tonnes (or -3.1%) from 2000. This was mainly due to an overall decrease from the sector of an estimated 588 tonnes (or -19.0%) and 282 tonnes (or -16.8%) in releases of carbon disulphide and hydrogen sulphide, respectively.

In 2001, facilities from the **Wastewater Treatment** and **Pulp, Paper and Paperboard Mills** industrial sectors accounted for approximately 90% of all releases to water:

- Facilities in the Wastewater Treatment industrial sector accounted for an estimated 77% of all reported releases to water in 2001. It is important to note that facilities in this sector treat wastewater and have limited opportunity for reducing inflow at the source. This fact distinguishes the sector from others that are listed here. The quantities reported to the NPRI in 2001 from this sector are greatly affected by the criteria for reporting. It should be noted that the NPRI reporting criteria have been revised for the 2002 reporting year.
- Facilities in the Pulp, Paper and Paperboard Mills industrial sector accounted for an estimated 12% of all reported releases to water and an estimated 20% of all reported releases to air in 2001. It should be noted that releases to water from this sector have decreased significantly over the years mainly due to the requirement of wastewater treatment activities at these facilities.

Table 4-1 Industrial Sectors Releasing the Largest Quantities of NPRI Pollutants On-Site in 2001, by Environmental Medium

		Releases (tonnes)						
CAS No.	Pollutant	Air	Water	Land	2001 Total	2000 Total	Change 2000–2001)	% change (2000–2001)
1. NAICS No. 2213 – Water, Sewage and Other Systems:								
NA	Ammonia (total)	0.1	22 522.9	10.1	22 533.1	20 980.3	1 552.8	7.4
NA	Nitrate ion in solution at pH ≥6.0	0.0	16 766.4	0.0	16 766.4	14 659.4	2 107.0	14.4
7782-50-5	Chlorine	0.0	115.8	0.0	115.8	130.5	-14.7	-11.3
NA	Manganese (and its compounds)	0.0	87.4	0.0	87.4	97.2	-9.7	-10.0
NA	Zinc (and its compounds)	0.1	85.8	0.0	85.9	118.8	-32.9	-27.7
Total all substances in sector		**0.7**	**39 643.5**	**10.1**	**39 654.2**	**36 071.9**	**3 582.3**	**9.9**
2. NAICS No. 3221 – Pulp, Paper and Paperboard Mills:								
67-56-1	Methanol	13 328.9	632.1	0.0	13 960.9	15 483.0	-1 522.0	-9.8
NA	Ammonia (total)	2 076.5	2 122.7	0.0	4 199.3	4 026.6	172.7	4.3
7783-06-4	Hydrogen sulphide	3 561.4	51.7	0.0	3 613.1	3 488.7	124.4	3.6
NA	Nitrate ion in solution at pH ≥6.0	0.1	2 116.0	0.0	2 116.1	2 080.9	35.1	1.7
7647-01-0	Hydrochloric acid	1 941.0	5.1	0.0	1 946.1	1 516.1	430.0	28.4
Total all substances in sector		**24 579.2**	**6 113.9**	**0.0**	**30 693.1**	**31 384.7**	**-691.7**	**-2.2**
3. NAICS No. 2211 – Electricity Generation, Transmission and Distribution:								
7647-01-0	Hydrochloric acid	12 860.3	0.0	0.0	12 860.3	13 576.6	-716.3	-5.3
7664-93-9	Sulphuric acid	4 163.7	32.0	0.0	4 195.7	4 041.8	153.9	3.8
7664-39-3	Hydrogen fluoride	1 604.0	0.0	0.0	1 604.0	1 723.6	-119.5	-6.9
NA	Manganese (and its compounds)	7.3	0.3	333.1	340.6	316.7	23.9	7.6
7440-62-2	Vanadium (and its compounds)	209.0	0.7	28.6	238.4	0.0	238.4	–
Total all substances in sector		**19 151.7**	**69.9**	**521.9**	**19 743.5**	**20 035.9**	**-292.4**	**-1.5**
4. NAICS No. 3253 – Pesticide, Fertilizer and Other Agricultural Chemical Manufacturing:								
NA	Ammonia (total)	8 816.4	53.8	0.0	8 870.2	9 471.9	-601.7	-6.4
67-56-1	Methanol	1 023.6	0.2	0.0	1 023.8	750.8	273.0	36.4
NA	Nitrate ion in solution at pH ≥6.0	13.7	117.5	0.0	131.3	92.1	39.2	42.5
7664-93-9	Sulphuric acid	45.9	0.0	0.0	45.9	28.0	17.9	64.1
7664-39-3	Hydrogen fluoride	18.7	0.0	0.0	18.7	20.6	-1.8	-8.9
Total all substances in sector		**9 930.0**	**171.5**	**0.7**	**10 102.2**	**10 382.3**	**-280.1**	**-2.7**
5. NAICS No. 2111 – Oil and Gas Extraction:								
75-15-0	Carbon disulphide	2 505.1	0.0	0.0	2 505.1	3 092.9	-587.9	-19.0
7664-93-9	Sulphuric acid	1 862.7	0.0	0.0	1 862.7	1 422.6	440.1	30.9
7783-06-4	Hydrogen sulphide	1 394.8	0.0	0.0	1 394.8	1 676.6	-281.8	-16.8
NA	Ammonia (total)	1 132.5	0.6	0.0	1 133.1	1 108.7	24.4	2.2
1330-20-7	Xylene (mixed isomers)	785.4	0.1	0.7	786.2	797.0	-10.7	-1.3
Total all substances in sector		**9 777.4**	**6.0**	**32.1**	**9 815.5**	**10 128.1**	**-312.6**	**-3.1**

Table 4-1 Industrial Sectors Releasing the Largest Quantities of NPRI Pollutants On-Site in 2001, by Environmental Medium

		Releases (tonnes)						
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NA	Ammonia (total)	0.1	22 522.9	10.1	22 533.1	20 980.3	1 552.8	7.4
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7782-50-5	Chlorine	0.0	115.8	0.0	115.8	130.5	-14.7	-11.3
NA	Manganese (and its compounds)	0.0	87.4	0.0	87.4	97.2	-9.7	-10.0
NA	Zinc (and its compounds)	0.1	85.8	0.0	85.9	118.8	-32.9	-27.7
Total all substances in sector		**0.7**	**39 643.5**	**10.1**	**39 654.2**	**36 071.9**	**3 582.3**	**9.9**
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7647-01-0	Hydrochloric acid	1 941.0	5.1	0.0	1 946.1	1 516.1	430.0	28.4
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7440-62-2	Vanadium (and its compounds)	209.0	0.7	28.6	238.4	0.0	238.4	–
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NA	Ammonia (total)	8 816.4	53.8	0.0	8 870.2	9 471.9	-601.7	-6.4
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Total all substances in sector		**9 930.0**	**171.5**	**0.7**	**10 102.2**	**10 382.3**	**-280.1**	**-2.7**
5. NAICS No. 2111 – Oil and Gas Extraction:								
75-15-0	Carbon disulphide	2 505.1	0.0	0.0	2 505.1	3 092.9	-587.9	-19.0
7664-93-9	Sulphuric acid	1 862.7	0.0	0.0	1 862.7	1 422.6	440.1	30.9
7783-06-4	Hydrogen sulphide	1 394.8	0.0	0.0	1 394.8	1 676.6	-281.8	-16.8
NA	Ammonia (total)	1 132.5	0.6	0.0	1 133.1	1 108.7	24.4	2.2
1330-20-7	Xylene (mixed isomers)	785.4	0.1	0.7	786.2	797.0	-10.7	-1.3
Total all substances in sector		**9 777.4**	**6.0**	**32.1**	**9 815.5**	**10 128.1**	**-312.6**	**-3.1**

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Environment Canada. *Notice with Respect to Substances in the National Pollutant Release Inventory for 2000 — Amendment*. Extract, *Canada Gazette*, Part I , December 23, 2000.

Environment Canada. Supplementary Guide for Reporting to the National Pollutant Release Inventory — Alternate Thresholds — 2000. Minister of Public Works and Government Services Canada, Ottawa, 2000.

Government of Canada. *Canadian Environmental Protection Act, 1999*. Statutes of Canada 1999. Chapter 33. Act assented to 14 September 1999.

Statistics Canada. *North American Industry Classification System (NAICS) Canada Manual — 1997*. Catalogue 12-501-XPE, Ottawa, 1998.

Statistics Canada. *Standard Industrial Classification — 1980*. Catalogue 12-501E, Standards Division, Ottawa, 1989.

5.2 Web Site References for Substance Information

A. Environment Canada

- The Green Lane: **www.ec.gc.ca/envhome.html**
- National Pollutant Release Inventory On-line Data Search: **www.ec.gc.ca/npri/**
- CEPA Environmental Registry: **www.ec.gc.ca/CEPARegistry/**
- New and Existing Substances: **www.ec.gc.ca/substances/**
- List of Toxic Substances (Schedule I of CEPA 1999): **www.ec.gc.ca/CEPARegistry/subs_list/Toxicupdate.cfm**

B. Health Canada

- Existing Substances Division: **www.hc-sc.gc.ca/hecs-sesc/exsd/index.htm**

C. International Links

- Agency for Toxic Substances and Disease Registry (ATSDR): **www.atsdr.cdc.gov/**
- Chemfinder: **chemfinder.cambridgesoft.com/**
- Environmental Defense Scorecard: **www.scorecard.org/**
- International Agency for Research on Cancer (IARC): **www.iarc.fr/**
- International Programme on Chemical Safety (IPCS): **www.inchem.org/**
- National Toxicology Program (NTP): **ntp-server.niehs.nih.gov/**
- Organisation for Economic Co-operation and Development (OECD): **www.oecd.org/home/**
- United Nations Environment Programme (UNEP): **www.unep.org/**
- World Health Organization: **www.who.int/dsa/cat97/zehc2.html**

5.3 Additional Sources of Information

Agency for Toxic Substances and Disease Registry (ATSDR)
1600 Clifton Road (E29)
Atlanta, GA 30333
U.S.A.
Tel.: (404) 639-6300
Fax: (404) 639-6315
Web site: **www.atsdr.cdc.gov/**

Canadian Centre for Occupational Health and Safety
Chemical Evaluation Search and Retrieval System (CESARS)
250 Main Street East
Hamilton, ON
L8N 1H6
Tel.: (905) 570-8094
Fax: (905) 572-2206
Web site:
www.ccohs.ca/products/databases/cesars.html

Commission for Environmental Cooperation (CEC)
393 St. Jacques Street West
Suite 200
Montréal, QC
H2Y 1N9
Tel.: (514) 350-4300
Fax: (514) 350-4314
Web site: **www.cec.org**

Health Canada
Publishing Coordinator
Environmental Health Centre
Tunney's Pasture 0801B3
Ottawa, ON
K1A 0L2
Tel.: (613) 957-3143
Fax: (613) 941-8632
Web site: **www.hc-sc.gc.ca**

International Agency for Research on Cancer (IARC)
150 cours Albert Thomas
F-69372 Lyon cedex 08
France
Tel.: +33 (0)4 72 73 84 85
Fax: +33 (0)4 72 73 85 75
Web site: **www.iarc.fr/**

National Library of Medicine (TOXNET)
8600 Rockville Park, Bldg. 38A
Bethesda, MD 20894
U.S.A.
Tel.: (301) 496-6531
Fax: (301) 480-3537
Web site: **www.nlm.nih.gov/hinfo.html**

APPENDIX A — **RELEASES AND TRANSFERS DEFINED BY NPRI**

On-site Releases:

An on-site release is a discharge of an NPRI-listed pollutant to the environment, within the physical boundaries of the facility. This includes:

- emissions to air — discharges through a stack, vent, or other point release, losses from storage and handling of materials, fugitive emissions, spills and accidental releases, and other non-point releases;
- releases to surface waters — discharges, spills, and leaks, but not including discharges to municipal wastewater treatment plants (which are reported under off-site transfers for treatment); and
- releases to land — spills, leaks, and other.

Final Disposal Activities — On Site and Off Site:

The following activities or operations are included in the category classified as "final disposal" — on site and off site:

- containment — two forms of containment are identified:

  i) landfill; and

  ii) other storage;
- underground injection;
- land treatment — for the purpose of land application or land farming; and
- off-site final disposal for storage.

Off-site Transfers for Treatment Prior to Final Disposal:

A shipment of an NPRI-listed substance may be transferred to an off-site location for treatment prior to final disposal. The treatment processes include:

- physical treatment (e.g., drying, evaporation, encapsulation, or vitrification);
- chemical treatment (e.g., precipitation, stabilization, or neutralization);
- biological treatment (e.g., bio-oxidation);
- incineration or thermal treatment where energy is not recovered; and
- treatment at a municipal sewage treatment plant.

Off-site Transfers for Recycling and Energy Recovery:

A shipment of an NPRI-listed substance may be transferred to an off-site location for recycling and energy recovery. "Recycling" refers to activities that keep a material or a component of the material from becoming a waste destined for final disposal. Nine types of recycling operations are identified:

- recovery of solvents;
- recovery of organic substances (other than solvents);
- recovery of metals and metal compounds;
- recovery of inorganic materials (other than metals);
- recovery of acids and bases;
- recovery of catalysts;
- recovery of pollution abatement residues;
- refining or reuse of used oil; and
- other recovery, reuse, or recycling activities.

An NPRI substance may be sent for energy recovery when the substance or the material containing it has sufficient energy content (BTU value) to allow its use as an alternative to fossil fuels or other forms of energy.

The printing processes used in producing this document conform to environmental performance standards established by the Government of Canada under Canada's *National Guidelines on Lithographic Printing Services*. These standards aim to ensure the environmental integrity of printing processes through reductions in toxic emissions to the environment, reductions in loading of wastewater, reductions in the quantity of material sent to landfills, and the implementation of resource conservation procedures.

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National Pollutant Release Inventory

Canadian Environmental Protection Act, 1999